Focus Article

Prolonged droughts, short-term responses, and diaspora: the power of water and pilgrimage at the sacred *cenotes* of Cara Blanca, Belize

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Every society considers some aspect of water holy or sacred, which was the case for the ancient Maya, where everything in life was rainfall dependent. Pilgrimage to such places, where people interact and engage with the sacred to keep the world on course, was vital. When pilgrimage does not work, more drastic measures can result, as we attempt to show with the Classic Maya (250–900 CE). Several prolonged droughts between 800 and 900 CE, ultimately resulted in an urban diaspora from interior southern lowland centers (and their intricate reservoirs) and most hinterland areas. During droughts, the Maya intensified their visits and rites at sacred water places, such as *cenotes* (steep-sided sinkholes filled by groundwater), to appease gods and ancestors. Excavation results from two structures near one *cenote* at Cara Blanca, Belize demonstrate via structure layout, artifact assemblages, and botanical remains, that the pool served as a pilgrimage destination for Maya who traveled from near and far to supplicate the gods to end the droughts—but it was to no avail. The Maya ultimately left this region that has some of the richest tropical soils in the world, and which in previous centuries had witnessed the emergence of the most powerful kings. People emigrated in all directions in search of water, land, and new opportunities. In the end, short-term responses did not work, but drastic ones such as urban diaspora did. © 2016 Wiley Periodicals, Inc.

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INTRODUCTION

Every society considers some aspect of water holy or sacred (Ref 1, pp. 83–84); pilgrimage to sacred waters was vital for the continuance of life and people from all walks of life journey to such places to interact and engage with the sacred to keep the world on its traditional course or as a source of renewal.[2] This was especially true for the ancient Maya, for whom everything, from agriculture to political systems, was rainfall dependent.[3–5] When pilgrimage does not work, more drastic measures are taken, as we attempt to show with the Classic Maya (250–900 CE) through discussing a watery pilgrimage site at which visits and ceremonies intensified during several multiyear droughts at the end of the Classic period ca 800–900 CE.

The Classic Maya are known for their royal temples, palaces, tombs, inscriptions, vibrantly painted ceramics, intricately incised jades and obsidian, and massive reservoir systems. They achieved these feats without metal tools, beasts of burden, or extensive irrigation systems. In this semi-tropical

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setting, seasonal rainfall (ca June through December) was critical for agriculture (maize, beans, squash, etc.) and to replenish reservoirs. Furthermore, much of the rain is absorbed by the permeable limestone bedrock, resulting in relatively limited surface water including near the most powerful Maya capitals of Tikal, Calakmul, Naranjo, and Caracol. Beginning in ca 100 BCE, rulers compensated for the lack of surface water by building reservoirs that increasingly became interlinked with urban layout.[6,7] Another notable feature of the Maya area is its high but dispersed biodiversity, including fertile soils that are mirrored in the settlement pattern where farmsteads are scattered throughout hinterland or noncenter areas. Royal reservoirs, large-scale ceremonies, markets, ballgames, and other public events in centers served to attract farmers during seasonal drought when water became increasingly scarce.[8] This system, which lasted nearly a millennium, eventually did break down—a phenomenon known as the Maya collapse.

The Terminal Classic collapse was heavily impacted by several prolonged droughts that struck between 800 and 900 CE,[9–12] ultimately resulting in an urban diaspora from interior southern lowland centers (and their intricate water systems) and most hinterland areas of present day southeastern Mexico, northern Guatemala, and Belize.[13] People had no choice but to leave; they depended on predictable rainfall for their livelihood and climate instability threatened their very existence. While each center has its own suite of resources, circumstances and histories, droughts exacerbated existing vulnerabilities (e.g., overuse of resources, political instability, mismanagement of resources, increasing reliance on massive reservoirs, etc.).[14–16] Consequently, distinct drought episodes impacted centers differently, which explains why it took about 100 years for the complete loss of royal power and concomitant diaspora. In the end, kings in the southern lowlands could not recover and their seats of power were abandoned. Centers and kings in the northern lowlands comprised by most of the Yucatán Peninsula, however, have different histories, which we do not discuss here. Water sources also differ; in the north, the water table is much higher due to the lower average elevation; subsequently, there are nearly 7000 *cenotes* (steep-sided karstic sinkholes fed by groundwater) that provide stable access to water.[17,18] In contrast, the water table is much deeper in the south due to its higher elevations, resulting in fewer sources of permanent water. Rainfall-dependent reservoirs at the core of most centers and royal power eventually ran dry, undermining both center infrastructure and political systems.[3,8] In the end, southern lowland kings lost power, while farmers survived; 7–10 million Maya currently live in Guatemala, Belize, and parts of southern Mexico and Honduras.[19]

The Maya made pilgrimages to sacred places to appease gods and ancestors, including portals to the underworld—that is, openings in the earth such as caves and water bodies. Rather than focusing on better-known caves,[20] we present evidence from a little explored type of portal, *cenotes*, at Cara Blanca Pool 1 in central Belize (see Figure 1). We show how short-term nonviolent responses, in this case pilgrimage, were to no avail and left little choice for most families but to leave their homes in much of the southern Maya lowlands, emigrating in search of water, land, and opportunities.

DROUGHTS AND PILGRIMAGE AT CARA BLANCA POOL 1

At Cara Blanca, there are 25 pools along the base of a limestone escarpment up to ca 100 m high. We have surveyed 22 pools (nos. 1–21, 24), five of which have associated settlement: 1, 7, 8, 9, and 20.[21–23] Most pools (nos. 1–5, 16–25) are *cenotes* up to 60 + m deep, and the others (nos. 7–14) are lakes ca 2 m deep (Ref 21, pp. 126–136). Pool 1 has little associated settlement, yet has year-round water. With year-round water and good agricultural soils at Cara Blanca, we would expect to see dense settlement, which we do, but only near lakes (e.g., Pools 7, 8, 9).[24] The Maya left *cenotes* largely untouched until the end of the Late Classic period (early 800's CE), when they built several special purpose buildings. We discuss the results of the 2013–2014 excavations of two of the seven structures at Pool 1 (100 × 70 m), a 62-m deep *cenote* (see Figure 2), particularly Str. 1, which we attempt to show served as a water temple and a pilgrimage destination to which Maya traveled from near and far to more directly supplicate gods and ancestors to end the droughts.

The Maya built Str. 1 (20 × 7.5 m, 3.5 m tall) at Pool 1's edge, perhaps even mirroring it, as suggested by the building's shifting orientation from 10° to 18° (see Figure 3). Str. 1 has been severely compromised by looting to the extent that the northeast portion of the building has collapsed into the water. In 2013, we exposed a collapsed corbel-vaulted building atop a 2-m wide stepped platform, exterior walls 0.85–0.9 m wide with cut stone façades, an exterior basal molding 6–8 cm wide, Rooms 1 and 2, and stucco fragments with remnant red paint.[25] We first thought that the Maya had built a range

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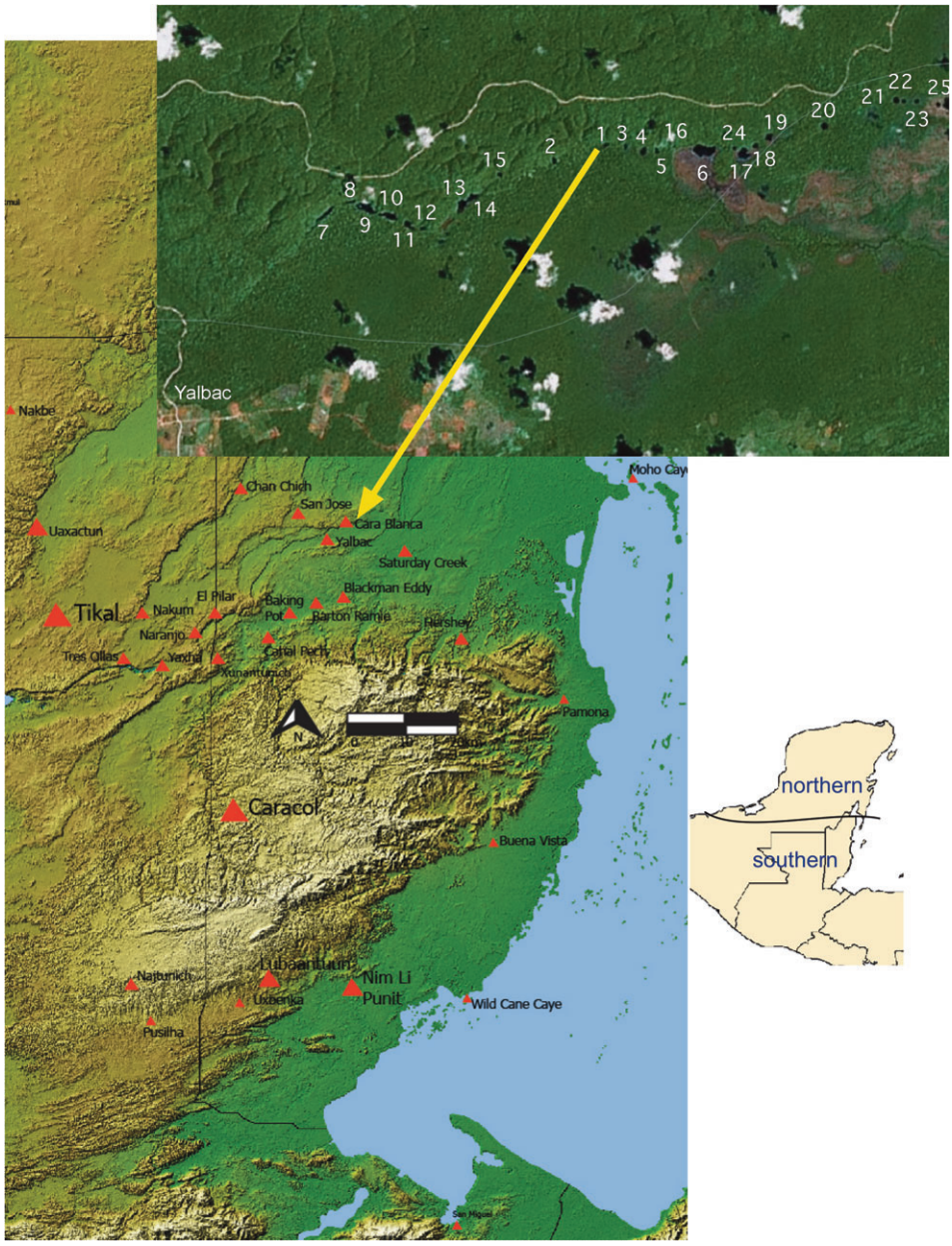

FIGURE 1 | Location of Cara Blanca, Belize and sites mentioned. Google map shows location of pools. Generated by L. J. Lucero

structure with two rows of matching rooms separated by a central wall; however, the 2014 excavations revealed a more complicated layout that included a bench in Room 1, offset rooms, and a passageway edged by a 20-cm high veranda wall that wrapped around the building in such a way that would have directed people to Room 2. We also exposed Room 3 and excavated 1-m wide trenches in the three rooms that exposed 9-cm thick plaster floors with 10- to 13-cm thick cobble ballasts and up to 1.7-m thick boulder and cobble fill, some with tufa. Tufa, a type of limestone, forms underwater when calcium carbonate precipitates around items submerged in water (e.g., fallen branches).[26] Fill deposits beneath floors in all rooms yielded distinct, yet relatively few, artifacts; for instance, Room 2 fill (1.7 m thick) only yielded artifacts after the first 0.75 m was removed, and then we recovered predominantly red and blue chert pieces and geodes. This fill yielded relatively few ceramics that included rare vessel types such as Roaring Creek Red and Dolphin Head Red vessels, rather than the usual Unslipped jars described below recovered from every other Room 2 context. Red symbolizes east and the

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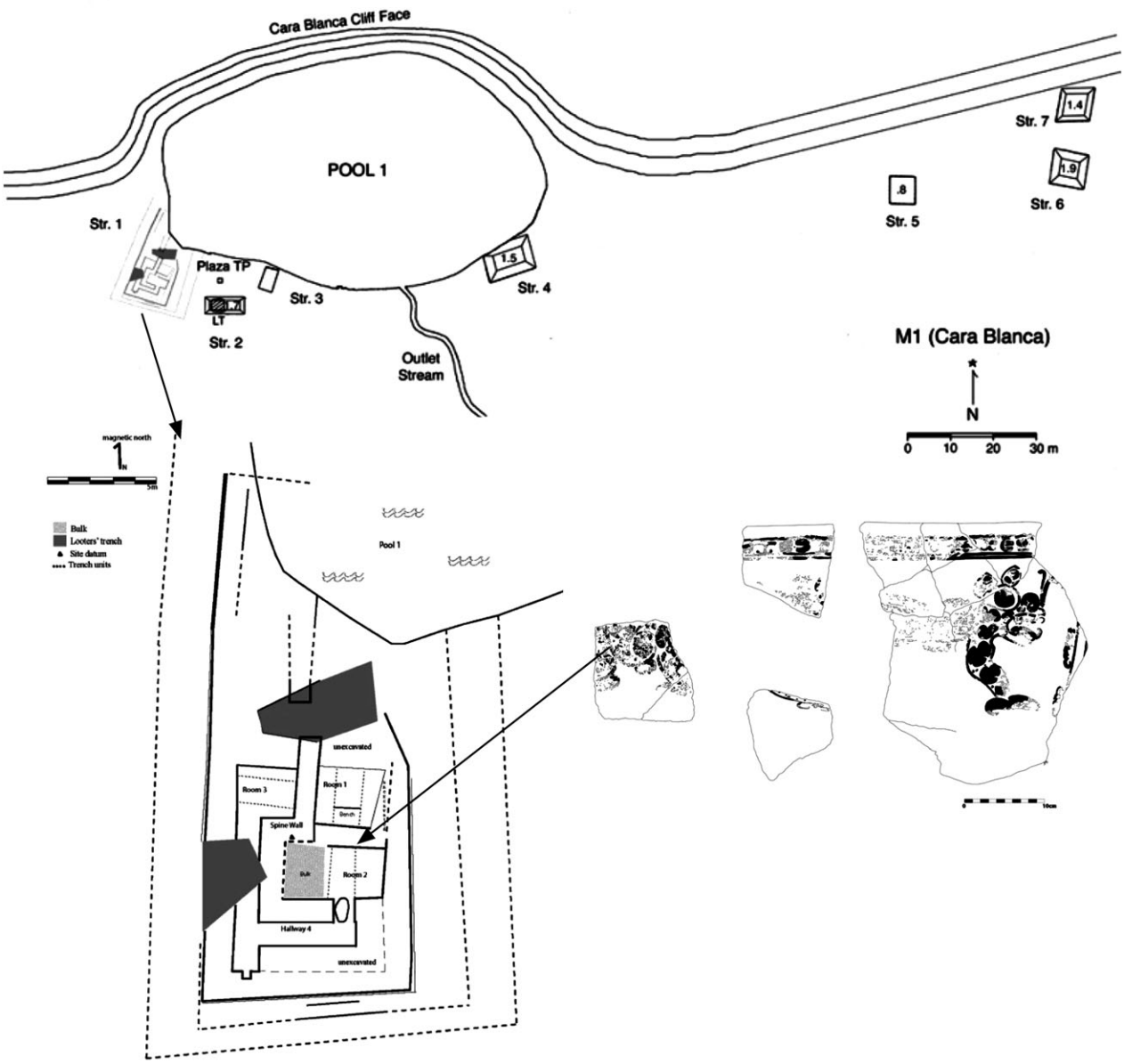

FIGURE 2 | Pool 1 structures highlighting Str. 1. The northeast corner has collapsed into the cenote. Jaguar vessel found in ceramic cluster along north wall on plaster floor in Room 2 (drawn by Joanne Baron). Str. 3 is ca 5 m from the cenote edge. Courtesy of VOPA

rising sun—that is, life and renewal; blue signifies the center of their watery world (Ref 27, pp. 27–40).

Ceramic chronologies, often refined with radiocarbon dates, are commonly used to date architecture,[28] especially when carbon samples are scarce, as was the case at Str. 1. We were able to type a total of 260 diagnostic sherds from Str. 1, the vast majority of which consist of Cayo Unslipped jars (75.4%). In fact, most contexts yielded Cayo Unslipped jars (see Figure 4), a common Terminal Classic (ca 800–900 CE) jar type in Belize. An element that stands out regarding these jar sherds is their varied rim lip treatments (e.g., squared, beveled, rounded, and pointed) and pastes (e.g., lighter buff or tan pastes and volcanic ash vs calcite temper). The diversity of lip treatments suggests a mingling of different ceramic styles at Cara Blanca. Gifford et al. (Ref 28, pp. 278–279) note that Cayo Unslipped jars may have squared, beveled, rounded, or pointed lip treatments; however, they do not report finding these diverse treatments in a single context. At Cara Blanca, these lip treatments are found together in single contexts, often as offerings (e.g., smashed on top of burned floor surfaces).

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FIGURE 3 | Drone shot by Tony Rath of Str. 1 taken in 2014 showing Pool 1 to the north. The 2-m wide platform is not visible because we covered it after the 2013 season to protect it. Black and white 1 m scale is oriented north–south. Courtesy of VOPA

FIGURE 4 | Collage of Str. 1 sherds, especially Terminal Classic Cayo Unslipped jar rims, their different rim treatments, and thumb-sized purposeful breaks (upper right three photos). Courtesy of VOPA

The majority of Str. 1 diagnostic sherds consisted of water jars (72.1%), followed by large serving vessels (bowls, dishes, plates) with orifices up to 55 cm in diameter (Table 1). The Maya also placed nine sherd clusters that included rare vessel types directly on the plaster floor along the north wall of Room 2, as well as at the southwest entrance. One of the Room 2 cluster vessels consists of a large (45-cm

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TABLE 1 | Vessel Types, Forms, Size, and Surface Treatment. (Compiled from Ref 40.)

	Saturday Creek	*Pool 1 Str. 1*	*Pool 1 Str. 3*	*Pool 20 M208*
Number of Late/Terminal Classic ceramic types	30, calcite temper	14, noticeable presence of volcanic ash temper	7, calcite temper	11, calcite and ash—some mixed tempers includes Early Classic cache ceramic type
Vessel distribution (%)				
Jars	32 (n = 204)	72.1 (n = 256)	70.9 (n = 170)	68 (n = 101)
Plates	0.5 (n = 4)	6.5 (n = 23)	3.8 (n = 9)	4 (n = 6)
Dishes	35 (n = 226)	4.5 (n = 16)	10.4 (n = 25)	8 (n = 11)
Bowls	32 (n = 210)	16.9 (n = 60)	15 (n = 36)	20 (n = 30)
Vases	0.5 (n = 3)	0	0	0
Average rim diameter (cm)				
Jars	24.1 (n = 204)	19.3 (n = 131)	20 (n = 170)	24 (n = 101)
Jar necks	—	25 (n = 119)	23 (n = 117)	—
Plates	39.5 (n = 4)	35.7 (n = 15)	37 (n = 9)	50 (n = 6)
Dishes	28.9 (n = 226)	40.3 (n = 13)	35 (n = 25)	27 (n = 11)
Bowls	26.1 (n = 210)	29.8 (n = 17)	32 (n = 36)	34 (n = 30)
Vases	16.3 (n = 3)	—	—	—
Rim diameter range (cm)				
Jars	10–48	10–45	10–40	8–55
Jar necks	—	15–40	8–40	—
Plates	24–44	29–55	30–40	50
Dishes	16–58	25–50	20–55	15–50
Bowls	10–48	10–50	10–60	10–55
Vases	12–19	—	—	—
Surface treatment (%)				
Unslipped	20.6 (n = 99)	80.4 (n = 222)	70 (n = 63)	14.3 (n = 5)
Red slip	61.8 (n = 445)	15 (n = 40)	26.7 (n = 24)	65 (n = 24)
Black slip	1.7 (n = 11)	0.8 (n = 2)	1.1 (n = 1)	2.9 (n = 1)
Orange slip	4.9 (n = 16)	—	2.2 (n = 2)	5.7 (n = 2)
Cream	8.5 (n = 55)	—	—	—
Polychrome	2.5 (n = 23)	3.5 (n = 9)	—	8.6 (n = 3)

Frequencies only include sherds that could be typed and measured. Str. 1 types include an Early Classic cache vessel. Pool 1 Str. 3 and Pool 20 sherds were poorly preserved, thus only a relatively few sherds could be typed. Jar neck diameters were only recorded for the 2014 season. See below for Pool 20 description; it is included here for the sake of comparison. Pool 20 red-slipped sherds largely consist of Terminal Classic jar necks.

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diameter orifice) but incomplete Fat Polychrome dish adorned with jaguars and water elements, a style originating in the northern lowlands of the Yucatán Peninsula (see Figure 2) (Ref 29, pp. 241–244; Ref 30, pp. 273–274). Other Cara Blanca ceramics also indicate nonlocal influences or visits, including ceramic types from the Petén region of Guatemala (e.g., Achote Black ceramics). Pieces of the Fat Polychrome vessel, including the base, a painted body sherd and a section of the rim, as well as their careful placement throughout the structure (e.g., south side, hallway surface near the doorway), suggest that the Maya broke the vessels, then removed parts and left the remainder as they moved through the temple in the process of ceremonially abandoning the building. The Maya had a cyclical worldview, whereby destruction begets creation (Ref 31, p. 151).[32] They lived in a world where everything and everyone had a life force, which had to be deanimated (dismantling or breaking and burning of things) before they entered the other world, were abandoned, or before they were reborn or rebuilt and reanimated. We found other artifacts associated with water, including fossils, that as far as we know only are found underwater ca 22 m deep along the *cenote* wall,[33] and blue chert pieces.

We also recovered nonceramic artifacts that do not reflect a typical domestic assemblage; five *mano* fragments (the hand piece for grinding maize) along the east wall on the platform and one near the ceramic clusters in Room 2 (see below); two hammerstones in Room 2 topsoil/roof collapse and one blue biface outside the west wall of the structure; faunal remains found throughout the building's topsoil/collapse, especially on the east (facing the water and plaza) and south (facing the plaza) sides, some quite charred, including bird and deer (most were too fragmentary to identify); marine shell in Room 3 and east side topsoil/collapse; edible freshwater shell (*Pomacea*) in Room 3 and near the ceramic clusters in Room 2; an obsidian blade fragment near the east wall of the structure; a large chert biface tool in Room 3 topsoil/collapse; and six small chert bifaces on the east side of the building.

Residential assemblages typically consist of 15–38% jars (Ref 34, Tables 5.2, 6.1), as well as complete groundstone sets (*manos* and *metates*) and stone agricultural and cutting tools. In contrast, the water collection jars, large serving vessels, and relative dearth of lithics at Str. 1 suggest that the structure had alternative purposes, namely public feasting and ceremonies, as found elsewhere in the Maya area (e.g., Ref 35) and other regions. For example, among ancestral Puebloan sites in the American southwest, larger serving vessels with more visible designs are used in public events, while in smaller spaces such as kivas, smaller vessels with smaller interior designs were used.[36] We also did not find individual serving and drinking vessels (vases), *metates* (the complement to *manos*), spindle whorls, agricultural tools (chert hoes, knives, scrapers, etc.), incense burners commonly used in rites, and burials typically found underneath house floors. While none of the vessels show charring from resting on a fire (cooking), many jar sherds from the exterior wall excavations show fire clouding on necks and rims, likely signifying part of termination rites, or another type of ceremonial burning typically done with incense burners. As mentioned, to the Maya everything was animated or had a soul; before something could be transformed or used for another purpose (becoming a dedicatory offering after having been used as a serving vessel, for example), they had to be deanimated or terminated.[37] Such rituals include breaking objects, destroying buildings, and burning incense (e.g., Ref 38). Based upon consistent thumb-size breaks, the Maya also purposefully broke off pieces from Cayo Unslipped jar necks and shoulders, perhaps as a means of deanimation (see Figure 4). The pieces they removed could have been taken home as a keepsake, deposited elsewhere, or thrown in the pool (for results of the diving programs, see: http://www.anthro.illinois.edu/faculty/lucero/index.html.)

The labor invested in this remote structure—tufa, large shaped vault stones, thick plaster floors, and other features—indicates the importance of this site. Ceramic types show that the Maya constructed the bench and additions within the same time frame, demonstrating the relatively brief amount of time in which they built, used, and abandoned Str. 1. The Maya expanded a smaller, late Late Classic/Terminal Classic building that may have been used by fewer local people for smaller-scale and intermittent rites when the droughts first struck. The upright vault stones on the summit and in the room debris suggest that the Maya later dismantled the roof. In fact, nearly everything we exposed is incomplete or broken; for instance, we found several sherds from the same vessels in different parts of the building (e.g., the large Fat Polychrome serving jaguar vessel). Str. 1 is further distinguished by the construction materials used for wall fill and as part of a termination ritual—tufa, which is not found in any other context at Pool 1. The Maya collected tufa from *cenotes*, even though there is plentiful surface limestone, suggesting that including material from water was essential. Str. 1's layout, features, location

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at the *cenote*'s edge, and its artifact assemblage indicating a specialized, nondomestic function suggest to us that it served as a water temple and Pool 1 as a pilgrimage destination. Other aspects about Pool 1 and other pools bolster this claim, as we detail below.

ADDITIONAL EVIDENCE FOR POOL 1 AS A PILGRIMAGE AND SACRED SITE

Str. 3, a 5.2 × 1.8 m (0.8 m tall) platform oriented 12°, is located 22 m southeast of Str. 1 and 5 m south of Pool 1.[39] In 2014, we exposed the north and west platform edges, revealing an extensively burned plastered surface on which the Maya had burned and smashed at least 357 vessels (Figure 5). Many sherds are charred and we were only able to type 90 of the rim and neck sherds, although we recovered 3826 sherds. The majority of the sherds date to the Terminal Classic; the few nonceramic artifacts found on the burned surface include one obsidian core, a *jute* shell, four burned bone fragments, seven chert flakes, and one chert biface. The vessel proportions and sizes are similar to those found at Str. 1 (see Table 1). Vessel forms also represent styles from different regions, and some have blended traits, an innovation that we do not see elsewhere at Cara Blanca (e.g., jar sherds with Tu-tu Camp Striated and Cayo Unslipped traits). The low percentage of rims (6%, $n = 240$) and extensive burning indicate that the Maya deanimated this platform by not only smashing vessels, but also by removing vessel parts, thus terminating not only the platform but also the vessels themselves. The final decommissioning act was to permanently seal the platform by concealing it with massive uncut boulders (60+ cm diameter).

Pool 1 ceramic assemblages also differ from residential assemblages at nearby sites, such as Saturday Creek, a minor center ca 11 km distant situated along the Belize River. It was occupied from ca 600 BCE until ca 1500 CE and consists of dispersed commoner farmsteads and elite compounds around a core area with several small temples and a ballcourt (Ref 8, pp. 70–75). The Terminal Classic ceramic assemblages of Cara Blanca and Saturday Creek differ in frequencies of vessel type, form, and paste[40] (see Table 1) highlighting that Maya used Strs. 1 and 3 for ceremonial purposes, while Saturday Creek ceramics indicate a permanent settlement of commoners and elites. Saturday Creek's Terminal Classic assemblage is similar to that of the nearby minor

FIGURE 5 | Str. 3 and Pool 1, as well as the thousands of body sherds (and few rims) on the burned plaster surface. Photo in lower left corner shows the large boulders the Maya placed on top of the platform as part of the termination ritual. Black and white scale is 1 m. Courtesy of VOPA

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center of Barton Ramie and major center of Xunantunich, linking it to Petén-influenced central Belize.[40] In contrast, Cara Blanca shows evidence for a stronger northern influence while also maintaining ties to central Belize and the Petén. This varied ceramic assemblage suggests that people from different regions of the Maya area journeyed here. While there is a possibility that nonlocal ceramics were traded into the Cara Blanca area, it is unlikely since Maya ceramic assemblages typically only have small numbers of nonlocal ceramics (see Ref 28; e.g., Ref 29, pp. 273–274; 30, 35), as seen at the closet centers, Saturday Creek, Yalbac, and San Jose (see Figure 1).[41,42]

Pool 1's botanical suite is also distinct, especially when compared to those at residential sites between the pools and the medium-sized center of Yalbac ca 9 km distant.[43,44] A botanical survey was undertaken to assess the hypothesis that the present forest represents a descendant forest reflecting ancient Maya forest management.[45] The Maya modified their landscape and selectively maintained certain plant species,[46,47] something they likely have been doing for millennia.[48–51] Surveys near Str. 1 at Pool 1 yielded common species typical of other Maya sites (e.g., ramón or *Brosimum alicastrum*), but in different concentrations. Most significant is the presence of copal (*Protium copal*), allspice (*Pimenta dioica*), and cotton (*Bombacopsis quinata*) trees, all of which the Maya used in ceremonies (e.g., Maya burned copal resin with its distinctive aroma as an incense in most rituals and continue to do so).[52–54] The relatively high concentration of vegetation with ceremonial significance suggests that the forest may have been selectively managed to increase its sacred character.

Evidence from other Cara Blanca pools suggests that Pool 1 may have been one of several visited, likely as part of a ceremonial circuit (Ref 32, pp. 141, 149) (see Figure 1). For instance, a group of buildings ca 400 m west of Pool 1 includes a circular sweatbath, from which we extracted a Cayo Unslipped jar rim; sweatbaths were typically used for ritual cleansing and other purification rites (Ref 32, pp. 89, 446). Since the sweatbath and associated buildings remain unexplored, we can only surmise whether some of them housed people, priests, and/or specialists, the latter of whom alternatively could have lived on the other side of Pool 1 ca 100 m to the east (see Figure 2). The sweatbath compound may have served as a staging area for pilgrims to stay, prepare, and ritually purify themselves. Part of this possible ceremonial circuit may have been in the steep hills above Pools 14 and 15 where seven structures were found, referred to as the Lookout group, on top of the escarpment (Ref 21, pp. 138–142). Kinkella, who surveyed Cara Blanca, suggests that it might have served as a water shrine, similar to what has been proposed for the Cerro de las Mesas mountaintop in the Copán Valley, which the Maya today still use for water and rain rituals.[55] There are also a few small caves or rock shelters in a gorge ca 500 m northwest of Pool 15, which may have been used for rituals indicated by the Late/Terminal Classic jar sherds (ca 700–900 CE) found inside.

Pool 20, a ca 100 m diameter 40-m deep *cenote* ca 3.8 km east of Pool 1, likely represents another stop on this ceremonial circuit. In a practice known as geomancy,[56,57] the Maya at Pool 20 integrated the architecture into the natural terrain, creating an enhanced, animated landscape. They shaped a terraced slope to create a large platform (38 × 26 m) onto which they built Str. M208-1 (22 × 12 m, 3.5 m tall) into the hillside ca 40 north of the pool.[58] At Str. M208-1, we excavated a north–south 1 × 10 m trench transecting its center. We exposed a staircase that the Maya had carved into the limestone bedrock; there was no wall on the south side of M208-1, but the structure was framed by walls on the east, west, and north sides—another example of the builders using the natural shape of the limestone hillock. Ceramic types indicate that M208-1 was used during the Terminal Classic. Superficially, the Pool 1 and 20 ceramic assemblages appear remarkably similar, with jars accounting for nearly 70% of the collection. However, there are notable differences in their sizes and types, as well as slipped versus Unslipped wares (see Table 1). Moreover, occupation at the two pools emphasizes different types of jars. While Pool 20 has a noticeable number of Sibun Red Neck jars, another Terminal Classic marker, Cayo Unslipped jars is the hallmark of Pool 1. The significance of the Sibun Red Neck jars or Cayo Unslipped jars is open to interpretation, but the two pools clearly have distinct yet related roles. The high percentage of jars at M208-1 indicates that the Maya conducted water-related ceremonies, though jars found at Pool 1 may be more standardized. Ceramics and other artifacts, including groundstone and obsidian artifacts, suggest residential and ceremonial functions.

The combination of the natural hills and *cenotes* would have served as an axis mundi, connecting all three worlds together in one place,[59] likely as part of a ceremonial circuit. Each *cenote* along the circuit would have served as the focal point for the performance of water rites. These rites and the effort

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employed in preparing and conducting them emphasize the spiritual and quotidian need for water during the Terminal Classic period.

CONCLUSION

Excavated materials from Cara Blanca suggest that Maya from near and far intensified their visits and rituals to sacred watery places during the century-long period of intermittent climate instability to plead with gods and ancestors to bring an end to the droughts. People came from northern Belize and the Yucatán Peninsula to the north, Guatemala to the west, and the Sibun area to the east. In the face of water shortages, the Maya relied on short-term responses. Intensifying water rites, however, did not work, and sacred sites and great centers were abandoned. Before departing the area for good, the Maya deanimated or terminated Pool 1 environs by dismantling, burning, smashing, and covering the water temple and associated items, particularly water jars. They, unlike southern lowland kings, survived by emigrating—some perhaps to Saturday Creek along a major artery, the Belize River; it has plentiful water from the river and aquifers and rich alluvium for agriculture, and was occupied until ca 1500 CE, immediately before the arrival of the Spanish (Ref 8, pp. 70–75).[60] The closest centers, Yalbac and San Jose (9 and 11 km distant) were abandoned by the late 800's.

Throughout the southern Maya lowlands in the Terminal Classic, long-standing social networks and political affiliations of the Late Classic unraveled, especially those closely linked with large-scale reservoir systems.[13] People left centers and hinterland areas in search of alternative means to ensure their survival. Ultimately, history witnessed the emergence of different social and economic networks elsewhere, including the northern lowlands, coastal areas, lakes, and the Belize River. Most Maya left a region with some of the richest tropical soils in the world, and one that previously had been witness to the most powerful kings and largest centers. These factors were not enough to offset the impacts of the droughts, and the only option was to leave their homes, communities, and centers.

Although the ancient Maya built sophisticated water management systems that allowed major cities to thrive in a seasonal green desert, they also could not endure the droughts. They ultimately abandoned these urban centers and surrounding hinterlands and emigrated in all directions. In conclusion, climate change had dramatic impacts on Maya society; while short-term responses did not work, drastic ones, such as urban diaspora, did.

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